OWNERS MANUAL

CAR AMPLIFIER
SuperNaturalSound

CAR AUDIO AMPLIFIERS
DS 100
DQ 200

NOTE!
Read this manual thoroughly before you start to install

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Congratulations, you have just purchased the finest auto stereo amplifier that today´s technology can offer. DLS offers a series of high quality car audio products for real music lovers, and we are sure that you will enjoy a high class car sound for many years.

NOTE, read the owners manual first!

To maximize the performance of your system, we recommend that you thoroghly acquaint yourself with it´s capabilities and features. Please take your time to study this manual before starting the installation. Then you hopefully know how to do a correct installation avoiding connecting errors that can cause damage to this fine product. Retain this manual for future reference.

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CAUTION!

Some of our amplifiers are capable of producing a sound pressure level that can cause permanent damage to your hearing system. High sound pressure levels combined with long time listening can give permanent damage to your hearing system. Choose a listening level that is comfortable for your ear.
To establish a safe level:
Start your volume control at a low setting. Slowly increase the volume until you can hear the music comfortly and clearly, without any distortion. Sudden sound shocks are dangerous.

The following noises can be dangerous with constant exposure:

90 dB	Subway, motorcycle, lawn mover	4 hours max
100 dB	Chain saw	2 hours max
120 dB	Rock band live concert	30 minutes max
140 dB	Gunshot blast, jet plane	0 minutes

1. GENERAL PRODUCT INFORMATION

Thank you for buying a DLS amplifier. The design is a result of many years of experience and listening tests.
Only the best components are used in this product. To ensure maximum performance and reliability, please follow the instructions and recommend-ations in the installation section.

2. INSTALLATION PREPARATION

Sections 2 - 4 in this manual are common for both amplifiers. In section 5 & 6 you will find connection diagrams for each amplifier model.

2.1 LOCATION

Careful planning before attempting installation will repay the small amount of extra time taken. Choose a location for the amplifier which will allow plenty of air to circulate around the fins on the top of the case. Vertical mounting is to prefer. Do not mount the amplifier upside down under the hat rack.
Mount the amplifier as far away as possible from the aerial if AM reception is important.
In the amplifier case there are double mounting holes to make the installation job easier. The screws supplied in the mounting kit are self drilling when used in a powerdriver. Should you wish to pre drill the mounting holes, use a 3,5 mm drill. If the hole locations do not line up with your mounting surface mount a separate fibre board or similar where you attach the amplifier. This will also isolate the amplifier chassie from ground.
NOTE! Before you start drilling, make certain that there are no fuel or brake lines or wiring looms behind where you intend to drill.

2.2 POWER CABLES

The DC power wiring is extremely important. It is essential that the amplifier at all occassions gets all the power it needs without voltage drop, otherwise both the dynamics and the good sound will be lost.
A poor battery can also cause a bad sound reproduction, escpecially in the bass range. Some-times it is necessary to mount an extra battery.
All cable connections requires a 2 mm hexagon key to connect the terminals.

In most cases a so called "Power Cap" can be useful. It is an energy storage capacitor designed to supple-ment audio amplifiers during high current demand. The overall bass response of your audio system will be enhanced with the use of this due to it´s ability to store a large amount of current and discharge it in a short period of time.

In the table below you will find suitable cable areas and fuse sizes for different cable lenghts.
The gold plated terminals will directly recieve power cables up to 16 mm^2 (5AWG).
Mount a fuse holder (DLS FH 1 or similar) on the DC -cable near the positive battery terminal. Use the same cable size from the negative amplifier terminal and connect to the nearest earth point.
Make sure to have a good earth contact, if necessary clean the metal from paint etc. A poor earth contact can cause damage to other parts in the system, for example the head unit if the earth current is forced to pass through the shield of the signal cable.

Recommended cable size for the DC-feed.

Cable length:	< 1,5 m	1,5 - 5 m	> 5 m
Amplifier:			
DS 100	10 mm^2	16 mm^2	21 mm^2
DQ 200	16 mm^2	21 mm^2	33 mm^2

Recommended main fuse for the amplifiers:

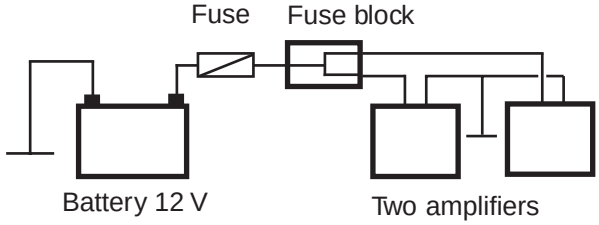
Amplifier	**Fuse value**	**Fuse holder**
DS 100	AGU 40 A	FH1/FH1B
DQ 200	AGU 60 A	FH1/FH1B

A cable of a certain size can´t have to large fuse, then the cable gets too warm before the fuse blows.

Max fuse values for different cable sizes:

6 mm^2 (9 AWG)	25 A
10 mm^2 (7AWG)	40 A
16 mm^2 (5AWG)	60 A
21 mm^2 (4AWG)	100 A
33 mm^2 (2AWG)	140 A
42 mm^2 (1AWG)	200 A

If you have more than one amplifier in the system you must increase the cable size and fuse compared to the table. When connecting two or more amplifiers use some of the DLS Fuse blocks with built in fuses to split the power to each amplifier. The short cable from the Fuse block to the amplifier can have a smal-ler size for easier installation.
Don´t connect to battery before you have double checked all connections.



2.3 SIGNAL CABLES

DS 100 has one gold plated phono socket pair provided to recieve the signal from the head unit.
DQ 200 has two phono socket pairs. One for each amplifier part.
When the amplifier is being operated in bridge mode both inputs must recieve an input for full power output.

Use high quality interconnects like the DLS SL5 PRO or similar with an effective shielding that prevents interference from the engine or alternator. When using this cable you must run a separate wire for the remote.

When you run the signal cables remember to keep them well spaced from the wiring loom and the power feed to the amplifier to avoid picking up interference. Lay the power cables and signal cables separated on each side of the car. Any extra cable must be laid in zig-zag style and definitely not coiled. Or cut it to correct lenght.

REMOTE WIRE
Some signal cables include a thin wire for remote amplifier start. High quality cables normally requires a separate wire for this. Connect between the head units remote cable (often the same cable that´s used for automatic power antennas) and the REM-terminal on the amplifier.

NOTE! If you want to start more than one amplifier using the remote output, the current load might be too high for som head units. High currents may damage the head unit, check in the manual for the head unit. Sometimes you must add a relay to the remote circuit that takes care of the higher current. If you are uncertain of how to connect the relay, ask your local DLS dealer for advice.

2.4 SPEAKER CONNECTION

The gold plated terminals will directly recieve speaker cables up to 6 mm^2 (9AWG). Always use high quality speaker cables such as **DLS SC 2x1,5, SC 2x2,5** or **SC 2x4.** Subwoofer connection requires 2 x 4 mm^2 cable.
Connect the speaker + (marked with + or a red dot) to the amplifier + terminal, and the speaker - to the amplifier -.
When fitting the cables to the terminals, remove only 10 mm of the insulation. Twist the wire strand together and insert the wire after loosening the terminal screw. Do not over tighten as this can cut the cable strands. Use a 2 mm hexagon key to the terminals.

If you want an extra high class speaker cable choose any of the DLS SCP, SCK, SC 4x1 or SC 4x1,5 cables.

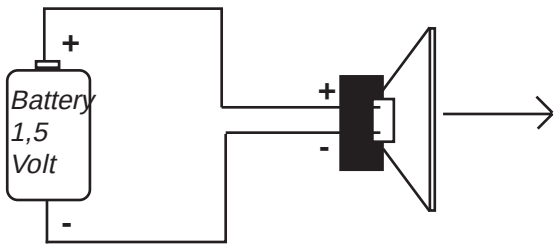
PROTECT YOUR CABLES!

To prevent the cable insulation from beeing damaged over sharp metal edges we recommend the use of cable protection tubes or similar. A damaged cable insulation could cause serious damage to the amplifier not covered by any guarantee.

SPEAKER POLARITY CHECK.

All speakers in a car audio system should be connected in phase (the same polarity). All speaker cones must move in the same direction. Out of phase speakers will cause a lack of bass, and a poor stereo soundstage.

Checking polarity:
Hold the - connection of the speaker wire to the - terminal of a 1,5 Volt flashlight battery. Tap the + wire on to the + terminal of the battery, and observe the movement of the cone. The cone should move outwards when the wire touches the battery, and inwards when the battery is removed. If it is the other way around, the speaker has been connected backwards and it must be removed and connected correctly.
If your system also has a subwoofer connected through a passive 6 or 12 dB crossover, try to connect this with various polarity and judge what sounds best. The phase shift in passive crossovers sometimes makes it necessary to change polarity.



NOTE! Tweeters can not be tested this way, double check the connections instead.

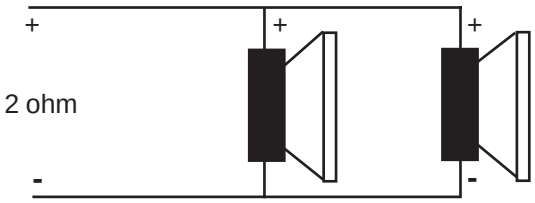
SPEAKER LOADS

Most car audio speakers have a 4 ohm impedance. DLS amplifiers can be loaded down to 2 ohm on each stereo channel.
In mono bridge mode operation the speaker load must never be less than 4 ohm. If you are using more than one driver they must be connected in a way so the impedance still is 4 ohm when connected to the amplifier. When you run the amplifier in mono bridge mode it sees a 4 ohm load as 2 ohm. On page 4 you find different speaker wiring examples.

Don´t forget that the output power from a multimode connected amplifier is more than double the normal power. The speakers must be able to handle this power.

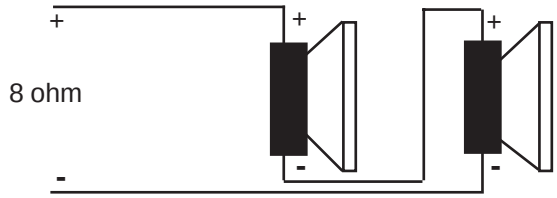
SPEAKER CONNECTION EXAMPLES

TWO 4 OHM SPEAKERS IN PARALLEL.



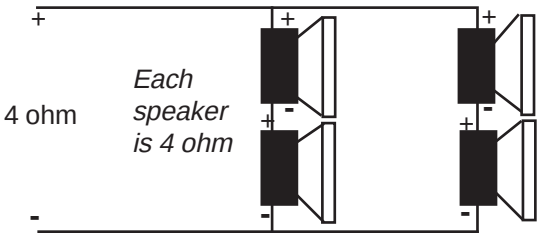
NOTE ! Not for bridge mode operation.

TWO 4 OHMS SPEAKERS IN SERIES.



Not a recommended way to connect, the power is only half.

SERIES / PARALLEL TO 4 OHM.



CAUTION!
In mono bridge mode the speaker impedance must never be less than 4 ohms. The amplifiers sees a 4 ohm speaker as a 2 ohm load.

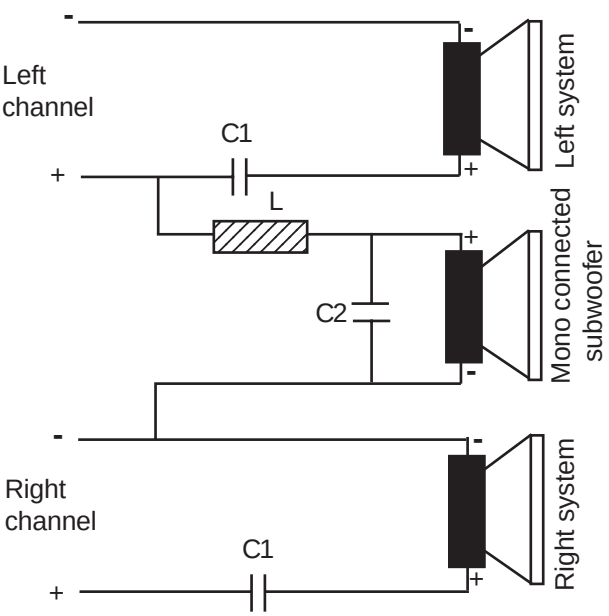
2.5 BRIDGE MODE OPERATION

Subwoofers are normally connected in mono bridge mode to the amplifier. This is done by connecting the speaker + to the amplifiers LEFT+ terminal, and the speaker - to the amplifiers RIGHT- terminal.
Now the speaker will recieve a signal that is the sum of the signals from each channel.

MULTIMODE OPERATION

Multimode operation means that you connect one or two systems in normal stereo mode and then add one or more subwoofers in mono bridge mode to the same speaker terminals. A center channel can be connected in the same way.
To avoid amplifier overload you must ALWAYS use passive filters in multimode operation. The subwoofer needs a 12 dB lowpass crossover and the stereo system needs a 6 or 12 dB highpass crossover.

MULTIMODE OPERATION SCHEMATIC



This drawing shows a mono multimode connected subwoofer together with a normal stereo system.

The subwoofer crossover frequency is 95 Hz (12 dB lowpass filter).
The stereo system crossover frequency is 140 Hz (6 dB highpass filter).

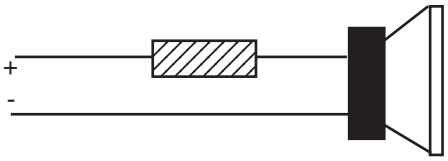
Components with 4 ohm speakers:
C1 = 200 µF
C2 = 300 µF
L = 10 mH with low resistance, 0,5 - 0,7 ohm

Do not use the amplifiers internal lowpass crossover.
Use only the amplifiers internal highpass crossover as a SUBSONIC filter adjusted to approx. 30 Hz.

2.6 PASSIVE CROSSOVERS

For maximum use of the DLS amplifiers it´s useful to know a little about passive crossover design. Passive crossovers are often used for conncting subwoofers in multimode operation or for center channel speakers. To remove frequencies over a certain frequency (the crossover frequency) use a filter with a 6 or 12 dB slope. This type of crossover is often used in combination with a subwoofer.

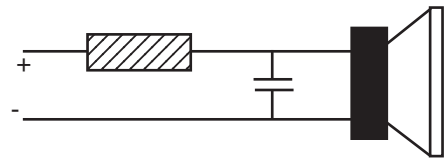
6 dB lowpass crossover:
Consists of a coil connected in series with the driver.



	20 mH	10 mH	6,3 mH
2Ω	64 Hz	32 Hz	50 Hz
4Ω	128 Hz	64 Hz	101 Hz
8Ω	256 Hz	128 Hz	203 Hz

This table shows the crossover frequency of a 6 dB lowpass filter at different impedances and frequencies.

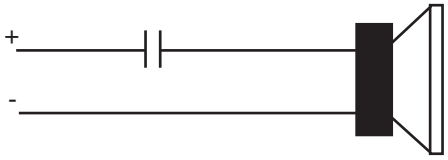
12 dB lowpass crossover:
Consists of a coil in series and a bipolar capacitor connected in parallel with the driver.



X-over freq.	Coil	Capacitor
62,5 Hz	14 mH	450 µF
95 Hz	10 mH	300 µF
140 Hz	6,3 mH	200 µF

Valid for 4 ohm speakers only.
This type is normally used for subwoofers.

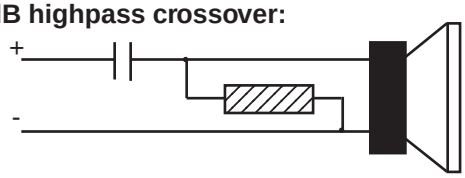
If you want to limit the lower frequency response, for example to a stereo system in multimode operation, a 6 dB slope crossover is perfect. Just connect a bipolar capacitor in series with the driver.
6 dB highpass filter:



	300 µF	200 µF	150 µF
2Ω	266 Hz	400 Hz	533 Hz
4Ω	133 Hz	200 Hz	266 Hz
8Ω	67 Hz	100 Hz	133 Hz

This table shows the crossover frequency of a 6 dB highpass filter at different impedances and frequencies.

12 dB highpass crossover:



X-over freq.	Coil	Capacitor
95 Hz	10 mH	300 µF
140 Hz	6,3 mH	200 µF
190 Hz	4,7 mH	150 µF

All valid for 4 ohm speakers.

NOTE! All DLS amplifiers are equipped with internal low- and highpass crossovers. External passive crossovers are used only in multimode operation.

2.7 LEVEL SETTING

To adapt the amplifier to all kind of signal sources with varying levels there are gain controls provided on the amplifier next to the phono sockets. They should not be used as volume controls.
Start with a "12 o clock" setting of the level controls. If you set the head unit volume to 75% of maximum you should achieve a good sound without distortion. Find a point of the level setting where the distortion is just discernible. At this point slightly reduce the control to eliminate the distorsion.
On a multi channel amplifier like the DQ 200 it´s necessary to adjust the levels indiviually to achieve a good sound balance between the different speakers, different speakers have different sensitivity. When using two of the channels for subwoofer operation, start the level adjustment on these channels. After having adjusted the bass level for good performance, adjust the level to the front system for a good sound balance. In multimode operation you can´t adjust the subwoofer level separately.

2.8 FINAL SYSTEM SETUP

Before connecting the amplifier to the battey, recheck all connections. When you connect the main fuse you will see a little spark, this is normal. But if the fuse blows at this moment, something is wrong. Recheck the cabling.
Turn on your head unit, the amplifier starts and the red LED is lit. Increase the volume and make sure all speaker works. Readjust levels and crossover settings if necessary. The level settings might need to be readjusted after 25 - 30 hours of use.

2.9 PROTECTION CIRCUITS

The amplifiers have an internal high current protection circuit shutting down the amplifier if the current draw is too high. It is indicated with a yellow LED. The protection circuits will reset by turning the head unit off and on again. There are two 25 Amp fuses on the front. Disconnect the main fuse before replacing any of these. Always replace with the same type and value.
The amplifiers also have a thermal protection that turns off the amplifier at 95 C. It will resume operation after cooling down. If necessary install an external cooling fan.

3. INTERNAL FILTERS

3.1 DS 100

DS 100 has an internal variable lowpass filter that can be switched in/out. It can be set from 50 up to 200 Hz. It also has an internal higpass filter that can be set from 15 up to 200 Hz.

LOWPASS FILTER:

The lowpass filter is normally used together with a subwoofer to remove higher frequencies over the crossover setting. A normal filter setting is 80 - 100 Hz.

HIGHPASS FILTER:

The highpass filter can be used in one of two ways. Either as a subsonic filter together with a subwoofer to remove the lowest frequencies which often causes a rumbling bass reproduction. A normal setting is 20 - 30 Hz.

The highpass filter can also be used together with a front or rear stereo system to remove frequencies below the crossover setting. In a system with a separate subwoofer it´s common to limit the bass reproduction to the front system. A normal setting is between 80 - 120 Hz, but feel free to try other settings.

3.2 DQ 200

DQ 200 has the same filter configuration as the DS 100, but it´s doubled as this is a four channel amplifier. Suitable filter settings at different connections is found in the section with connection examples.

4. FAULT FINDING GUIDE

If problems occour during the installation, or later, this guide might help you to find out whats´s wrong.

THE AMPLIFIER IS DED:

1. Check power lead, ground and remote connections at the amplifier using a multi meter.
2. Check the battery terminal connections.
3. Check the power lead fuse or circuit breaker. If fuse damage continues, inspect the power lead for short circuits.
4. Check the amplifier protection fuses. Are these broken change to new ones with the sama value. If short circuiting continues, contact your local DLS dealer. A fault may exist in the amplifier.
5. To start the amplifier requires a remote voltage of 9-15 volt. Check the voltage with a multi meter.

AMPLIFIER PROTECTION FUSE BLOWS AT LOW VOLUME :

1. One or more speaker cables are shorted. Make an insulation test with a multi meter. The cables must not have a connection to earth.

THE AMPLIFIERTURNS OFF AFTER 10 - 30 MINUTES.

The amplifier is overheating due to inadequate ventilation. Check mounting position is free from obstruction.

Do this:

1. Move the amplifier to a place with better ventilation.
2. Install one or two fans to cool down the heatsink.
3.Overheating can also be caused by an impedance load below the level permitted. Refer to the section about speaker loads.

NO OUTPUT FROM ONE OR MORE SPEAKERS:

Check the following:

1. Balance control position.
2. Fader control position.
3. Speaker cable connections to both amplifier and drivers.
4. Signal lead plugs and cables.
5. Change left and right signal lead plugs in the amplifier to see if the problem moves to a different speaker, the the lead has a fault. If the problem remains, the speaker or amplifier are at fault.

4.1 NOISE PROBLEMS

WHINING NOISE VARYING WITH ENGINE REVOLUTIONS:

Do this:

1. Rewire the power supply (12 V) to source unit direct from battery.
2. Rewire ground wire from source unit to clean position on chassis.
3. Check all power connections to ensure that they are clean and tight.
4. Check quality of system ground connection.

CONSTANT WHINING NOISE:

Do this:

1. Ensure that all equipment is grounded at the same place.
2. Check quality of earth strap connection from battery negative terminal to chassis.
3. Disconnect signal cables from amplifier to see if noise disappears. If so the leads are picking up noise. Test this by laying a new cable over the seats and reconnecting to the amplifier. If the noise does not return, re-route original cable away from source of interference.

If noise remains regardless of cable position, try to use so called Quasi-balanced signal cables. DLS PRO-cables are Quasi-balanced.

5. CONNECTION DIAGRAMS DS 100

On the following pages you find some examples of how to connect the amplifier for different use. The pictures show normal level and filter settings.

DS 100 can be connected in many different ways:

1. As a stereo amplifier connected with a speaker system of coaxial, 2-way or 3-way type. Two speaker systems can be connected in parallel, one front and one rear system.

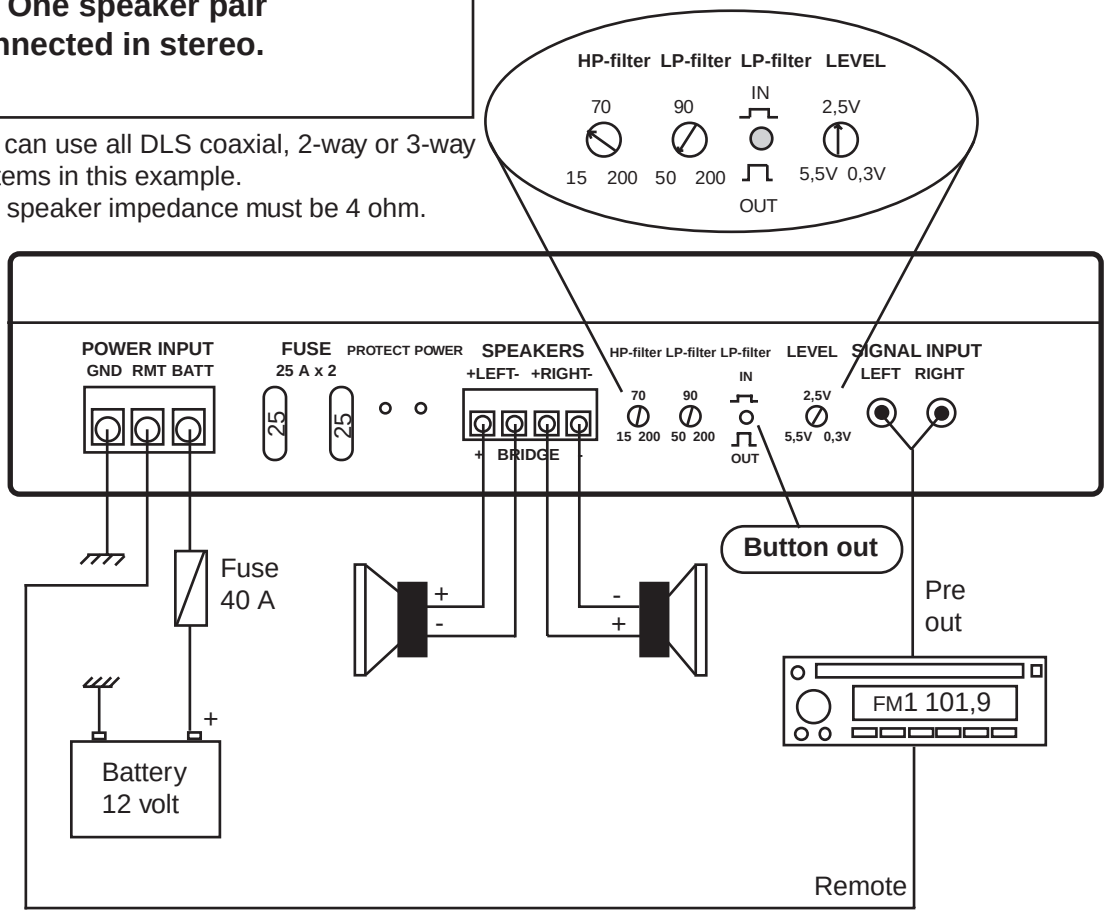
2. As a subwoofer amplifier with max two 4 ohms subwoofers per channel in stereo, or max one 4 ohm subwoofer in mono bridge mode. The built-in lowpass crossover is used.

3. In multimode with one system in stereo and one 4 ohm subwoofer connected in mono bridge mode using a passive crossover filter for both the front system and the subwoofer. Connect as in the example 5.4 or use DLS premade multimode filter.

4. Using two DS 100 you can run the front system on one of them (example 5.1) and the subwoofer on the other (example 5.3). The highpass filter to the front system amplifier should be set at 80 - 100 Hz, or maybee higher. Make your own tests for best result.

5.1 One speaker pair connected in stereo.

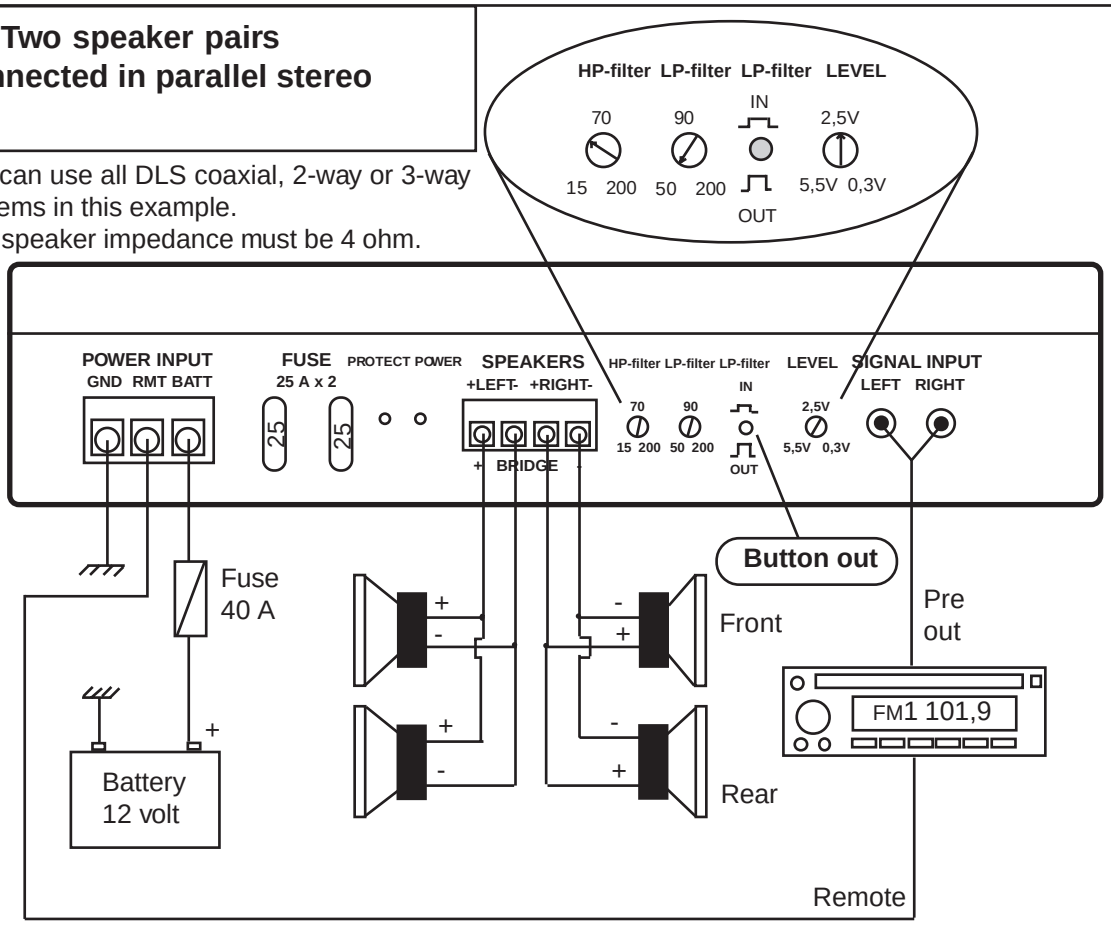
You can use all DLS coaxial, 2-way or 3-way systems in this example.
The speaker impedance must be 4 ohm.



For power cable, speaker cable and fuse size selection we refer to section 2.2 - 2.4

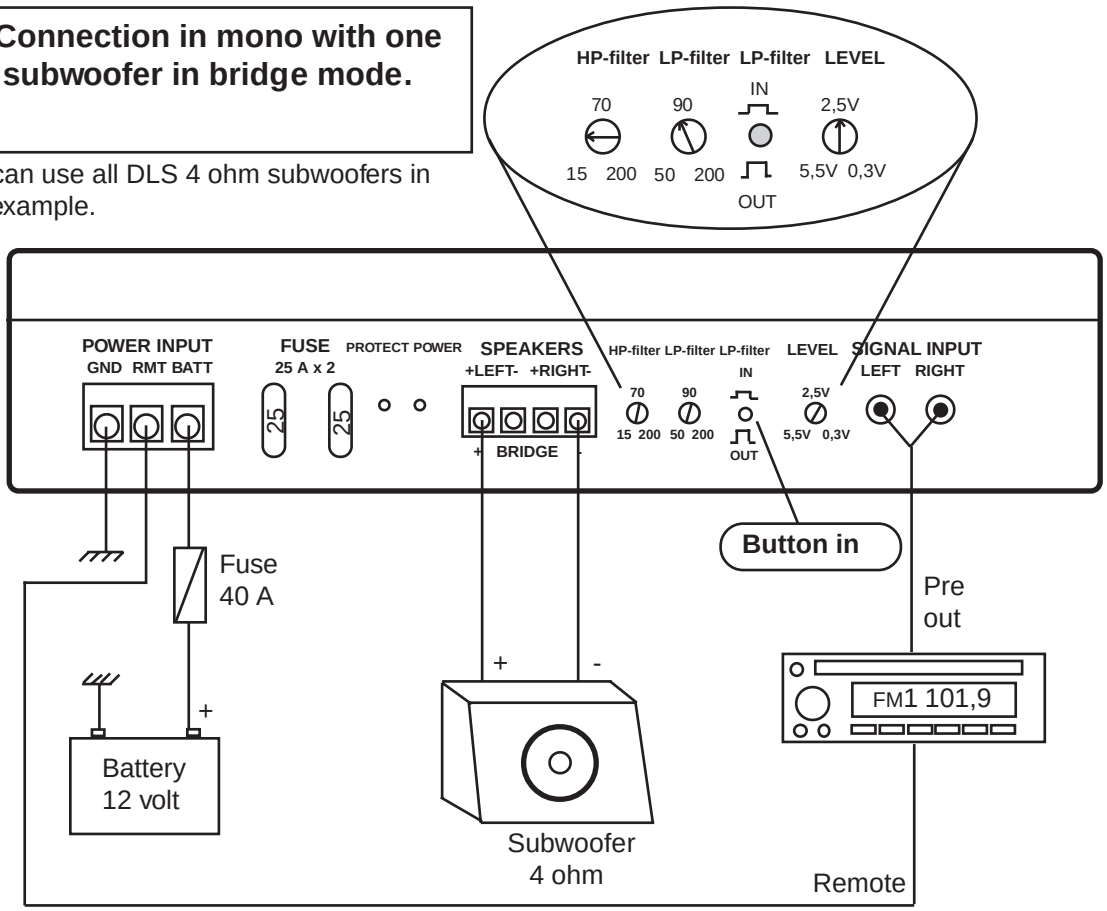
5.2 Two speaker pairs connected in parallel stereo

You can use all DLS coaxial, 2-way or 3-way systems in this example.
The speaker impedance must be 4 ohm.



5.3 Connection in mono with one subwoofer in bridge mode.

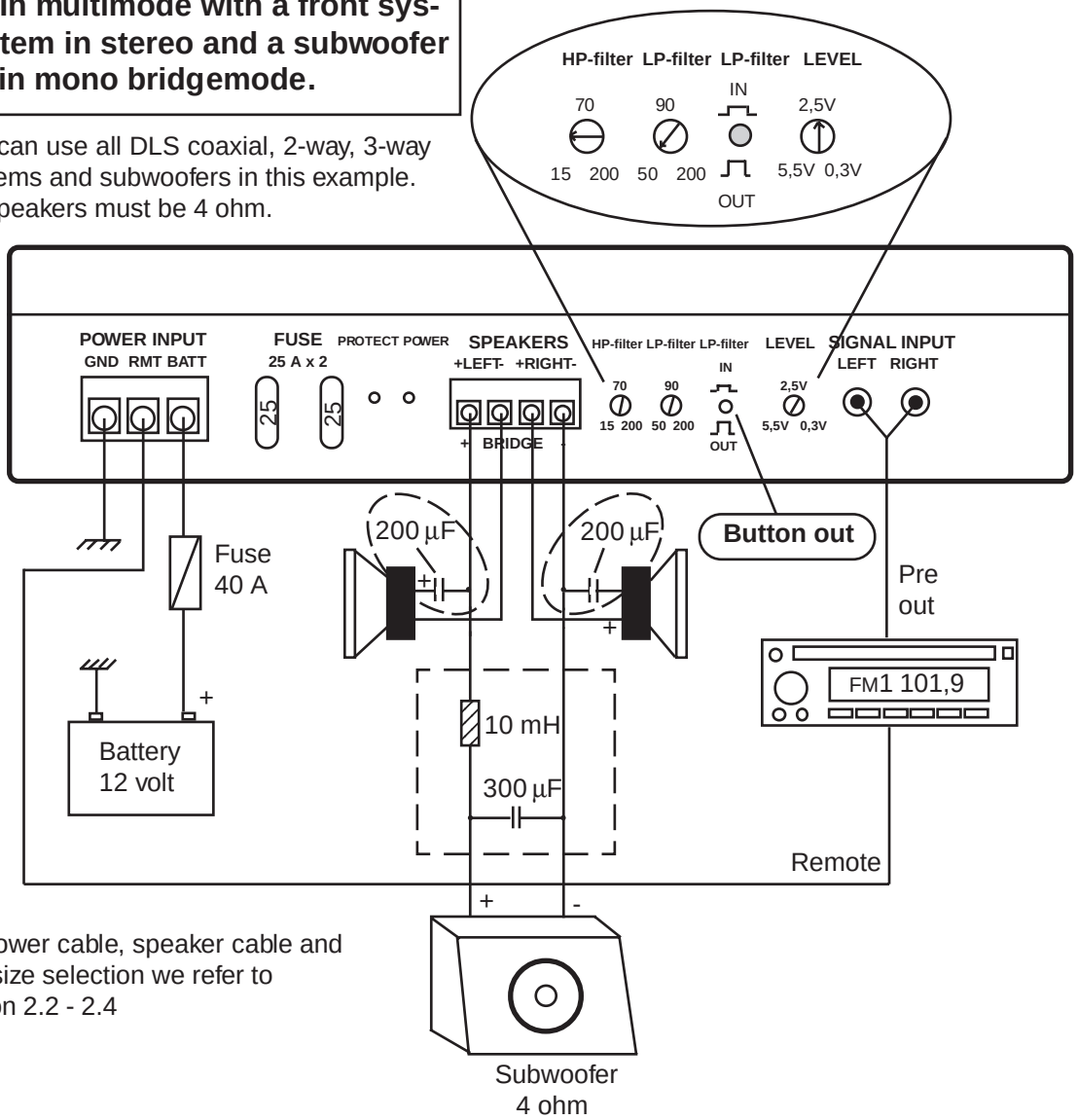
You can use all DLS 4 ohm subwoofers in this example.



For power cable, speaker cable and fuse size selection we refer to section 2.2 - 2.4

5.4 In multimode with a front system in stereo and a subwoofer in mono bridgemode.

You can use all DLS coaxial, 2-way, 3-way systems and subwoofers in this example. All speakers must be 4 ohm.



For power cable, speaker cable and fuse size selection we refer to section 2.2 - 2.4

Subwoofer
4 ohm

MULTIMODE OPERATION:

In multimode operation you can connect a speaker system in normal stereo mode and a subwoofer in mono bridge mode on the same output terminals.
To split the signals between the speakers passive crossovers must be used.
Connect a 200 µF capacitor in series with the plus leads to the stereo system (works as a 6 dB highpass crossover). To a two- or three way system it´s enough to connect the capacitor in series with the woofer driver.
Connect a 12 dB lowpass crossover to the subwoofer consisting of a 10 mH coil in series and a 300 µF capacitor in parallel with the subwoofer. The components used are shown in the drawing. The coil must have a low inner resistance to avoid losses. Use the DLS 10 mH, 0,47 ohm coil with art. no 10-42310.

WARNING!
Never run a multimode connected system with the subwoofer disconnected and still having the 300 µF capacitor connected. The output circuits in the amplifier can be damaged. Solder the capacitor directly on the subwoofer terminals so it will be disconnected at the same time as when you disconnect the subwoofer.

6. CONNECTION DIAGRAMS DQ 200

The following examples shows some normal ways of connecting this 4-channel amplifier. The drawings shows normal level and filter settings. The four channels are divided in two amplifier blocks with the signal input to the right, then the level control, the filter and to the left the speaker terminals.

DQ 200 can be connected in many different ways:

1. As a stereo amplifier with one front and one rear system.
These can be of coaxial, 2-way or 3-way type. Two speaker systems can also be connected in parallel. For example one pair in the back doors and one pair in the hat rack connected to the rear output on the amplifier.

2. One front (and if you want also a rear system) in the doors or dashboard, and one subwoofer in mono bridge mode to the amplifier rear output.

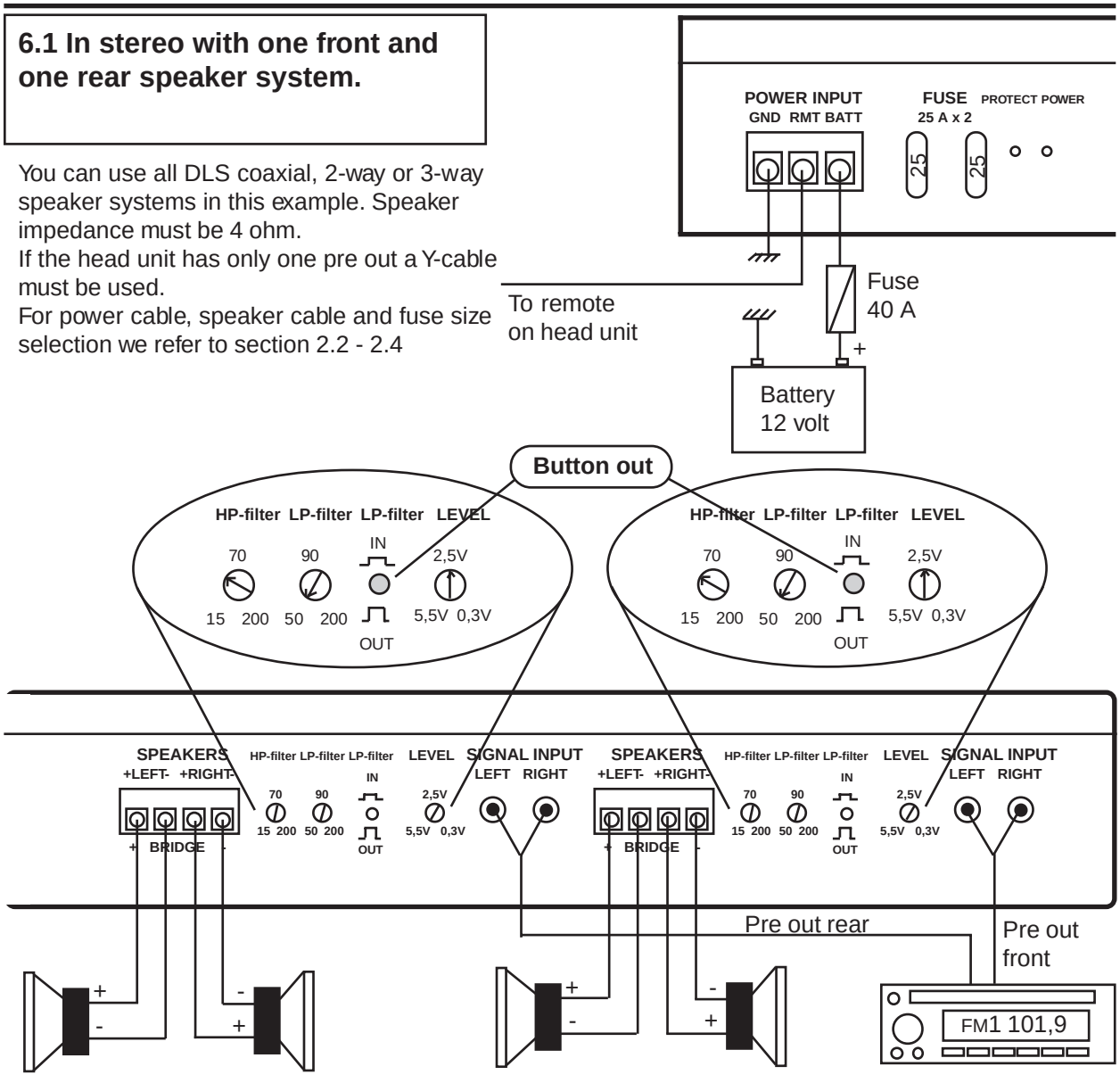
3. In multimode with a front stereo system connected to front output, and a rear stereo system to rear output together with a subwoofer in mono bridge mode using passive crossovers.

4. A stereo system connected in mono bridge mode on both front and rear output. This gives a higher output to the speakers.

5. A 3-way system can be connected with active crossover between woofers and mid/tweeters.

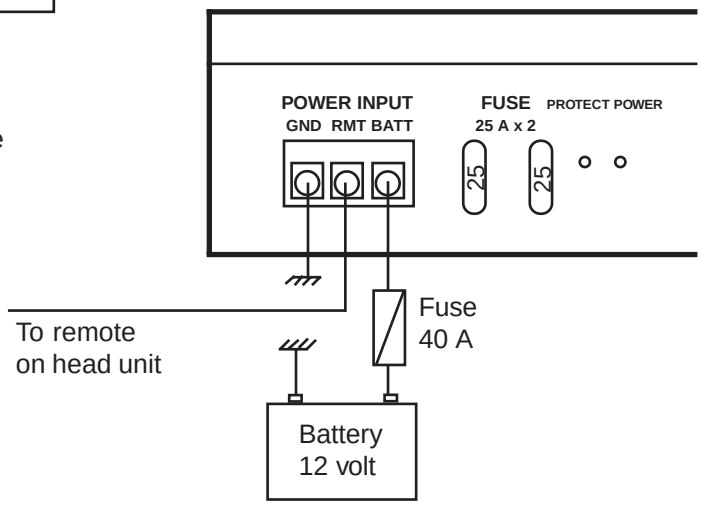
6.1 In stereo with one front and one rear speaker system.

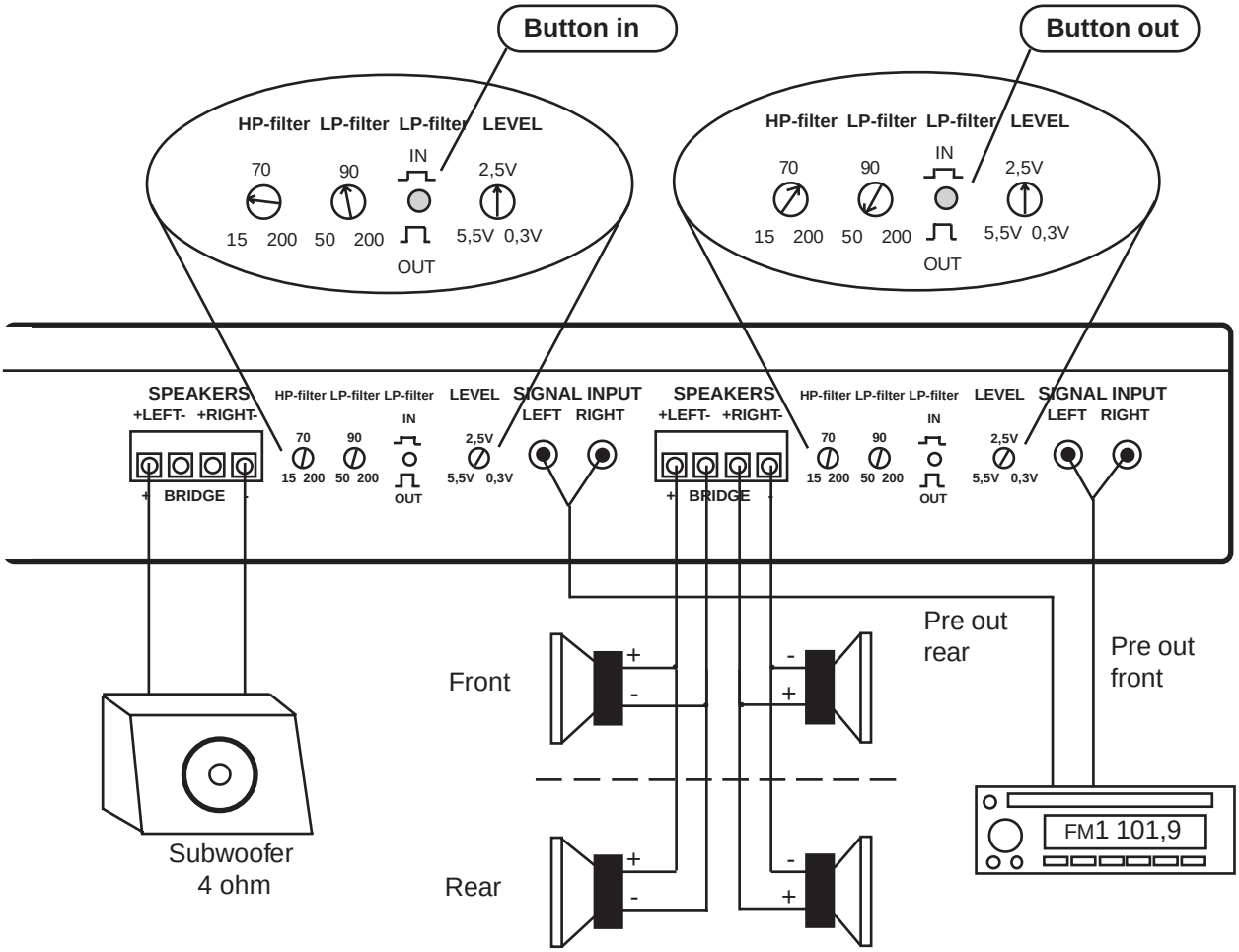
You can use all DLS coaxial, 2-way or 3-way speaker systems in this example. Speaker impedance must be 4 ohm.
If the head unit has only one pre out a Y-cable must be used.
For power cable, speaker cable and fuse size selection we refer to section 2.2 - 2.4



6.2 Connection of a front system in stereo and a subwoofer in mono bridge mode.

You can use all DLS coaxial, 2-way or 3-way speaker systems in this example. Speaker impedance must be 4 ohm.
If the head unit has only one pre out a Y-cable must be used.
For power cable, speaker cable and fuse size selection we refer to section 2.2 - 2.4



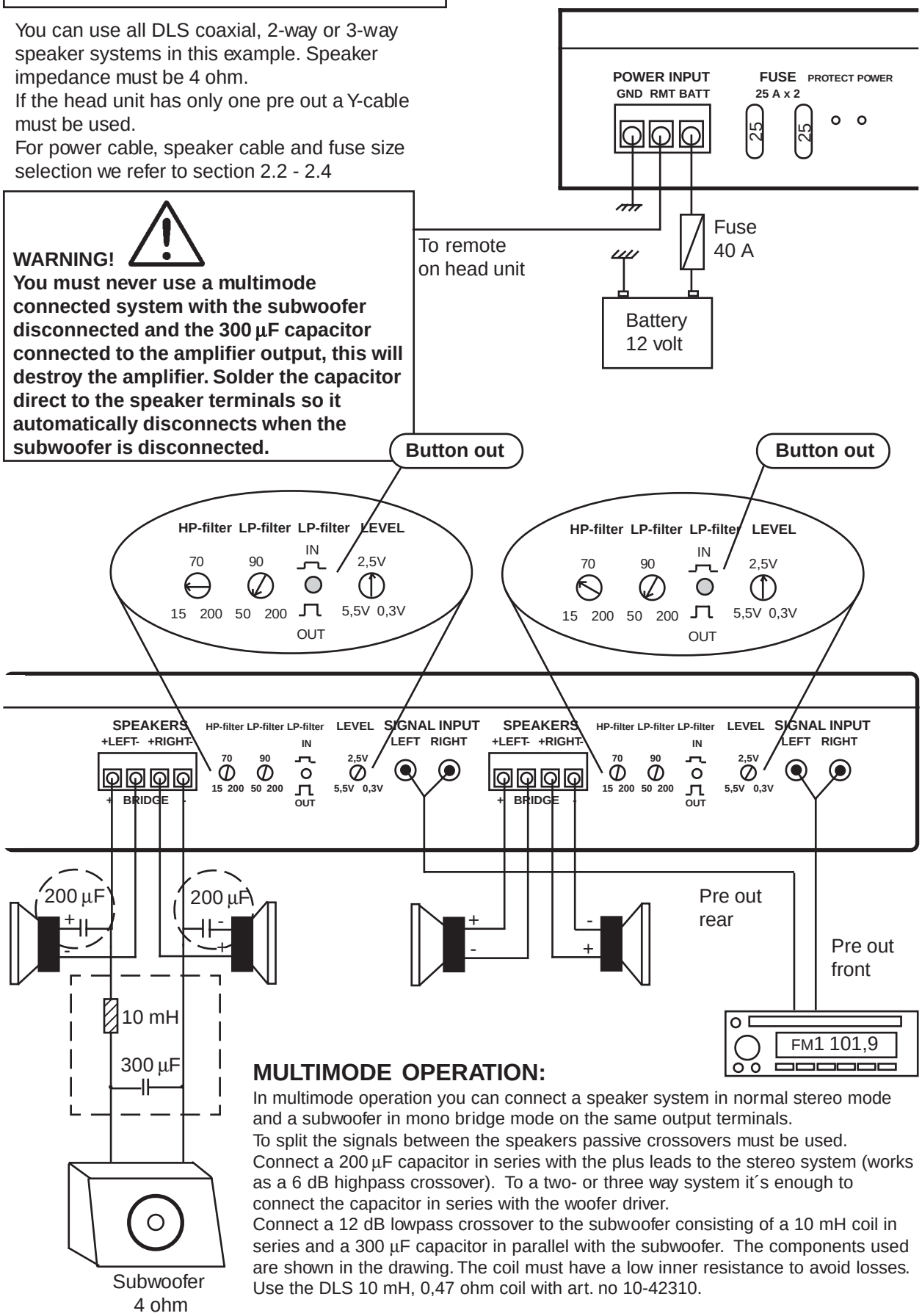


You can connect one or two systems in stereo to the speaker terminals. These are connected in parallel.

6.3 Connection of a front and rear stereo system and a subwoofer connected in multimode.

You can use all DLS coaxial, 2-way or 3-way speaker systems in this example. Speaker impedance must be 4 ohm.
If the head unit has only one pre out a Y-cable must be used.
For power cable, speaker cable and fuse size selection we refer to section 2.2 - 2.4

WARNING!
You must never use a multimode connected system with the subwoofer disconnected and the 300 µF capacitor connected to the amplifier output, this will destroy the amplifier. Solder the capacitor direct to the speaker terminals so it automatically disconnects when the subwoofer is disconnected.

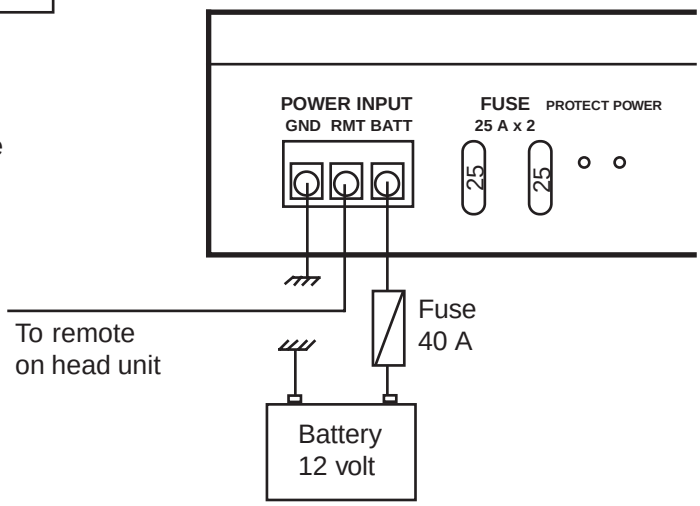


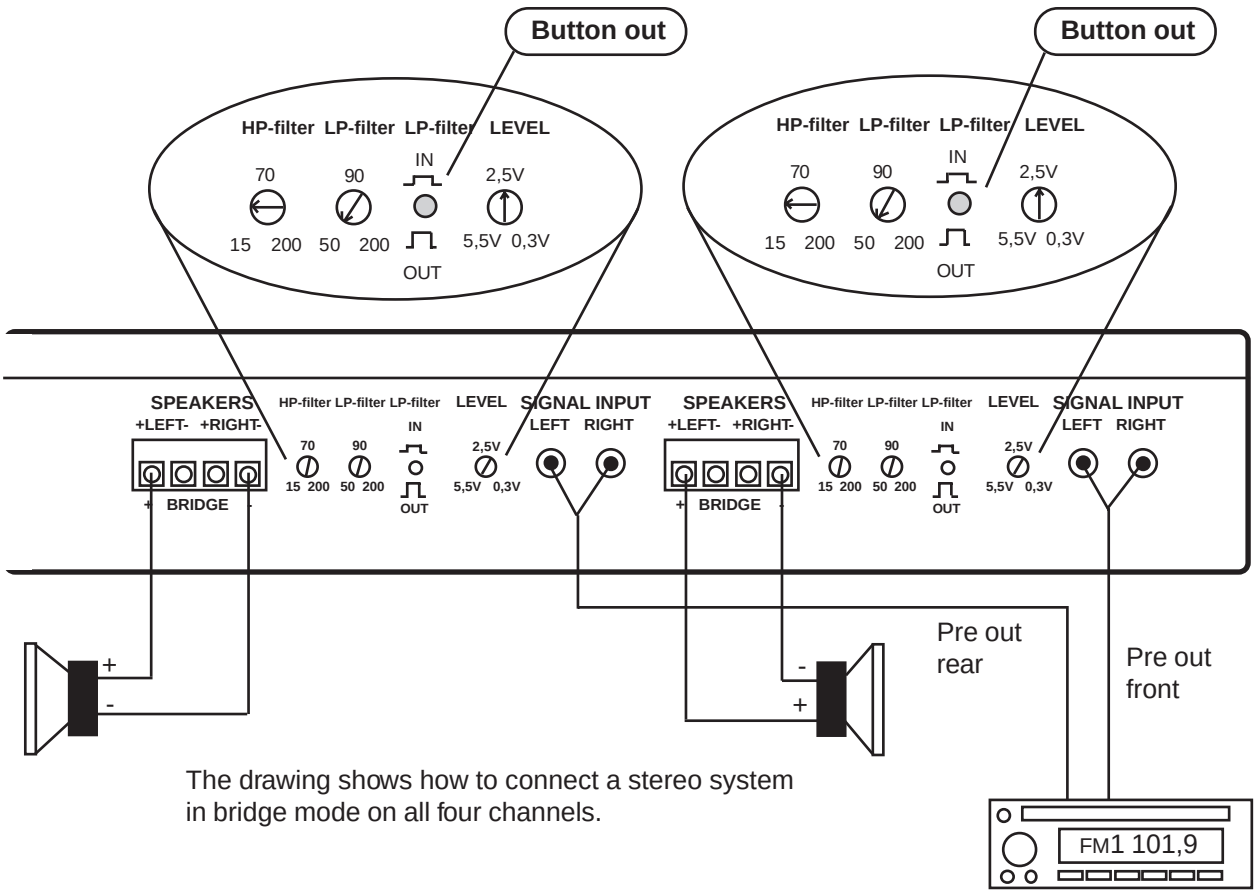
MULTIMODE OPERATION:

In multimode operation you can connect a speaker system in normal stereo mode and a subwoofer in mono bridge mode on the same output terminals.
To split the signals between the speakers passive crossovers must be used.
Connect a 200 µF capacitor in series with the plus leads to the stereo system (works as a 6 dB highpass crossover). To a two- or three way system it´s enough to connect the capacitor in series with the woofer driver.
Connect a 12 dB lowpass crossover to the subwoofer consisting of a 10 mH coil in series and a 300 µF capacitor in parallel with the subwoofer. The components used are shown in the drawing. The coil must have a low inner resistance to avoid losses. Use the DLS 10 mH, 0,47 ohm coil with art. no 10-42310.

6.4 Connection of a front systerm in stereo connected in bridge mode on all four channels.

You can use all DLS coaxial, 2-way or 3-way speaker systems in this example. Speaker impedance must be 4 ohm.
If the head unit has only one pre out a Y-cable must be used.
For power cable, speaker cable and fuse size selection we refer to section 2.2 - 2.4

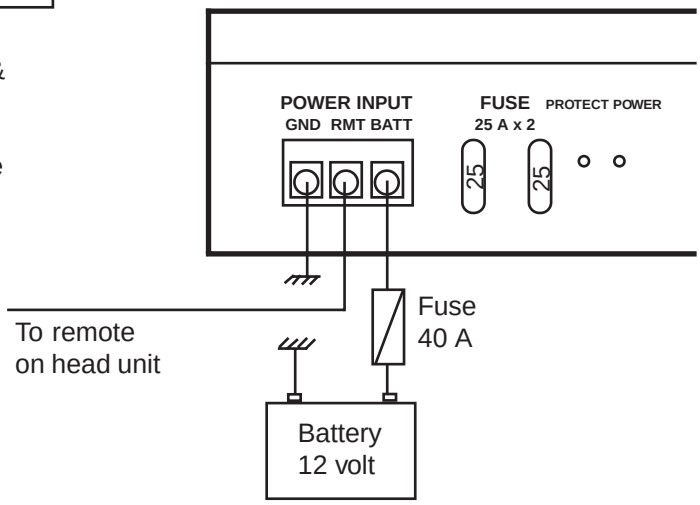


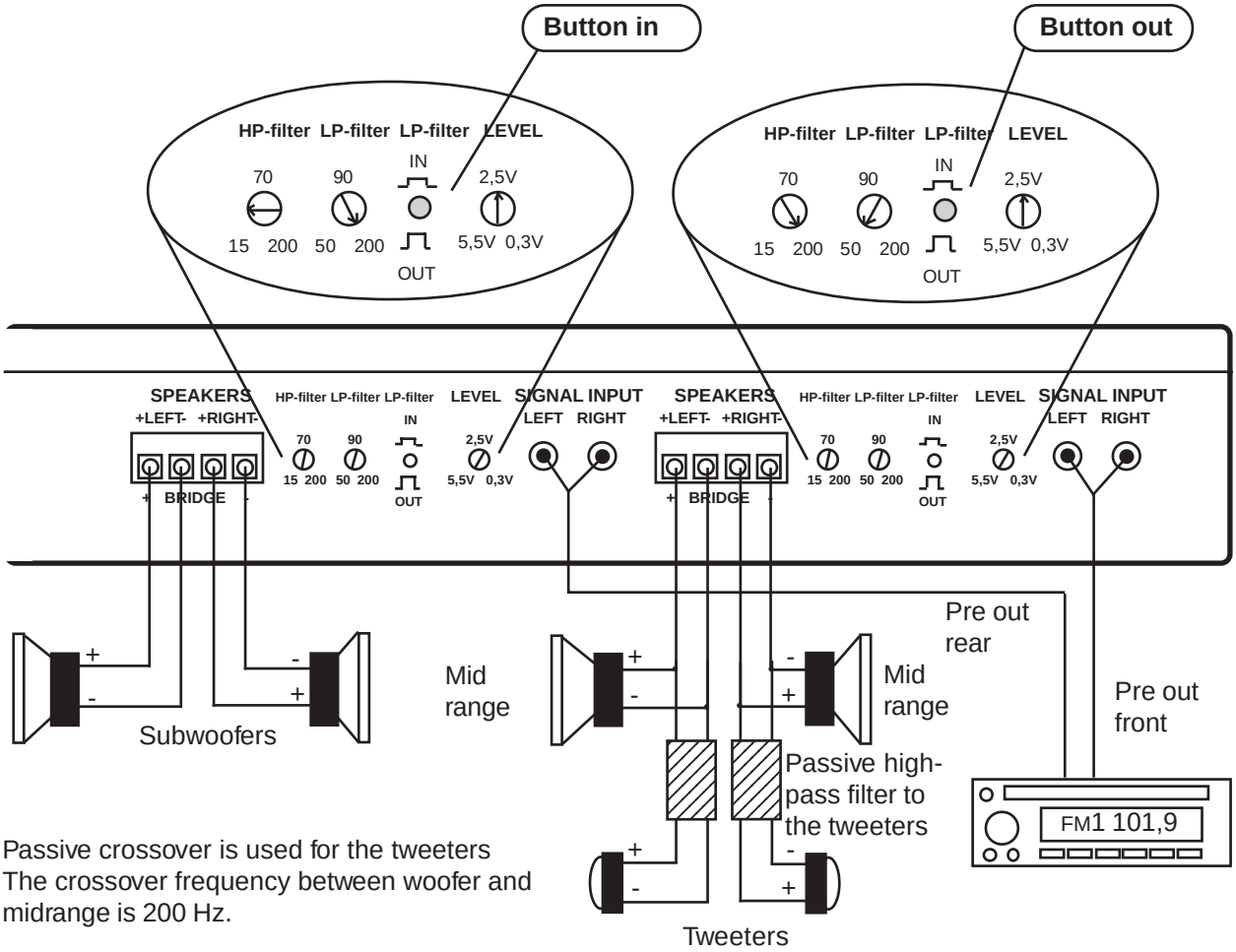


The drawing shows how to connect a stereo system in bridge mode on all four channels.

6.5 Connection of a 3-way system using active crossover between woofer and midrange.

You can use all DLS 3-way systems in this example. For example DLS R 36, R 38, U35 & U36.
Speaker impedance must be 4 ohm.
If the head unit has only one pre out a Y-cable must be used.
For power cable, speaker cable and fuse size selection we refer to section 2.2 - 2.4





Passive crossover is used for the tweeters
The crossover frequency between woofer and midrange is 200 Hz.

7. SPECIFICATIONS

FACTS ABOUT DLS AMPLIFIERS

MODEL	**DS 100**	**DQ 200**
Channels	2	4
Mode	AB	AB
Output power at 13,5 Volt, 20 Hz - 20 kHz with 0,1% THD max:		
4 ohm nominal power RMS	2 x 50 Watts	4 x 50 Watts
4 ohm max power RMS	2 x 65 Watts	4 x 60 watts
2 ohm max power RMS	2 x 100 Watts	4 x 80 Watt
4 ohm bridge mode RMS max	220 Watts	2 x 180 Watts
THD	< 0,1%	< 0,1%
S/N ratio, A-weghted	> 100 dB	> 100 dB
Damping factor	> 200	> 200
Input impedance	15 kohm	15 kohm
Input sensitivity	0,3 - 5,5 volt	0,3 - 5,5 volt
Frequency respone	20 Hz - 20 kHz	20 Hz - 20 kHz
Crossover, highpass	15 - 200 Hz	15 - 200 Hz
Crossover, lowpass	50 - 200 Hz*	50 - 200 Hz*
* Switchable in/out		
Filter slope	12 dB/octave	12 dB/octave
Fuses	25 A x 2	25 A x 2
Max kabelare ström:	16 mm^2	16 mm^2
Max kabelarea högtalare	6 mm^2	6 mm^2
Protection circuits	Current and thermal	Current and thermal
Power consumption:		
Idle	0,7 A	1,0 A
Max current	37 A	55 A
Remote	26 mA	26 mA
Dimensions:		
Width	290 mm	400 mm
Heigth	65 mm	65 mm
Depth	240 mm	240 mm
Weigth	4 kg	5,4 kg

Use the 2 mm hexagon key for the power and speaker terminals.

Notes about the product:

Model no:_____ Serial number:_____

Retailer:_____

Date of purchase: _____ Date of installation: _____

Make your own installation notes about connections, crossover setup or just draw your own system schematic.